

Running Head: PATIENTS WHO LEAVE NMCP'S EMD WITHOUT BEING SEEN

Patients Who Leave Naval Medical Center Portsmouth's
Emergency Medicine Department without Being Seen
Naval Medical Center, Portsmouth, Virginia
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Abstract

Since opening its Charette Health Care Center in April 1999, Naval Medical Center Portsmouth has seen a dramatic increase in not only the number of patients presenting to its Emergency Medicine Department (EMD), but also patients who “Leave Without Being Seen” (LWBS). This prospective, qualitative study identifies which patients are most inclined to LWBS and the reasons these patients LWBS. Patients who left without being seen typically: (a) came to the EMD on a Monday or Tuesday, (b) presented during the hours of 12:01 p.m. to 4:00 p.m., (c) had a chief complaint of abdominal pain, (d) waited more than 12 minutes to be triaged, or (e) were to be seen in the Main EMD.

Whereas, patients that were most likely to wait to be seen either: (a) came to the EMD on a Wednesday, (b) presented during the 4:01 a.m. to 8:00 a.m. time frame, (c) cited a fever as the chief complaint, (d) were triaged with an urgent condition, or (e) were to be seen in the Pediatric ED. Although these traits may characterize these two groups of patients, a meaningful predictive model could not be constructed to profile the groups.

This study also entailed attempting to administer a questionnaire to every patient who left without being seen. A total of 71 of the 95 patients who left the EMD without being seen were contacted, a 75% response rate. Most patients stated they felt better since leaving the EMD. The primary reasons these patients left the EMD was because they were tired of waiting, had other commitments, or felt too sick to wait. These patients reported waiting an average of two hours prior to leaving the EMD. The majority of patients who were interviewed also stated they would likely return to this EMD again in the future.

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Patients Who Leave Naval Medical Center Portsmouth's
Emergency Medicine Department without Being Seen

Naval Medical Center Portsmouth (NMCP), Virginia is the home of not only the United States (U.S.) Navy's oldest hospital, but also the Navy's newest medical treatment facility, the Charette Health Care Center. Having just opened in April 1999, the Charette Health Care Center encompasses over one million square feet and has a bed capacity of 320 beds. NMCP is a fully accredited tertiary care facility offering a wide variety of inpatient and outpatient services. NMCP's Graduate Medical Education (GME) Programs provide internship and residency training in medicine, surgery, psychology, dentistry, and pastoral care. As one of the Navy's three major teaching hospitals, NMCP has residency programs in 13 specialty areas, including emergency medicine.

NMCP is staffed by approximately 4,300 personnel and is a primary source of health care for the 420,000 eligible beneficiaries residing in Hampton Roads (<http://www-nmcp.med.navy.mil/NMCPHistory/abvhist.htm>, 1999). Eligible beneficiaries include active duty service members and non-active duty beneficiaries (active duty family members, retirees, and retiree family members). In 1983, the U.S. Office of Management and Budget designated Hampton Roads as the Norfolk-Virginia Beach-Newport News Metropolitan Statistical Area (MSA). Virginia's Isle of Wight and Mathews Counties, as well as North Carolina's Currituck County, were subsequently added to this MSA in 1993. With over 1.5 million residents, Hampton Roads is the 27th largest metropolitan area in the United States ([This is Hampton Roads](#), 1999). Norfolk Naval Base, the world's largest naval base, as well as over 100 ships, 27 aircraft squadrons, and 35 large shore activities, is located in Hampton Roads ([Ibid.](#)).

In October 1999, an average of 217 patients presented to NMCP's Emergency Medicine Department (EMD) per day, projecting an annual census of approximately 79,000 patient visits. Approximately 150 personnel, including 15 attending physicians, 27 emergency medicine residents, 3 nurse practitioners, and 6 physician assistants, staff the EMD. The EMD consists of six clinical areas and includes the Main EMD, Children's Emergency Care Unit, Fast Track, Resuscitation Room, Observation Unit, and Decontamination Unit. The Main EMD is for patients requiring thorough evaluations and consists of eight "open bay" beds and nine private examination rooms. The examination rooms are usually reserved for patients requiring greater privacy (e.g. patients undergoing pelvic, rectal, or psychiatric examinations). Patients who present with primary care-related conditions, non-urgent acuity levels, are generally seen in the Fast Track area. A physician assistant staffs the Fast Track area seven days a week during the hours of 8:00 a.m. to midnight. The Children's Emergency Care Unit (Pediatric ED) is for patients less than 18 years of age presenting with relatively minor conditions. This unit has four examination rooms and is staffed by a nurse practitioner during the same period as the Fast Track. The Resuscitation Room is for patients with life-threatening conditions. The Observation Unit is used for patients requiring additional care or observation, generally not to exceed 24 hours in duration. Lastly, the Decontamination Unit is set aside for patients suffering from exposure to nuclear, biological, or chemical agents.

A registered nurse conducts an initial triage of every patient that presents to the EMD. Patients with emergent conditions are immediately taken to a treatment area. However, most patients must first complete the registration process. Upon doing so, patients are then seated in the waiting room and await triage. During triage, Hospital Corpsmen

perform an assessment of the patient, obtain vital signs, and assign a triage category. This EMD uses four triage categories: emergent (requires immediate treatment for life or limb-threatening conditions), urgent (must be seen within a couple of hours), semi-urgent (needs to be seen within several hours), and non-urgent (treatment can safely be delayed). Triage categories are assigned based upon written guidelines, as well as the patient's vital signs and chief complaint.

Conditions prompting the study.

After testing a series of Congressionally mandated demonstration projects for a variety of alternative health care delivery systems, the Department of Defense (DoD) began restructuring its Military Health System (MHS) into a managed care program called TRICARE. Beginning in 1993, TRICARE was implemented on a regional basis to enhance beneficiary access to quality health care and control rising health care costs in a period of military downsizing and budgetary constraints. The DoD spent approximately \$15.5 billion on health care services in fiscal year 1997. With TRICARE, the MHS is entrusted with coordinating and managing the delivery of health care for over 8.2 million eligible beneficiaries. Eligible beneficiaries include 1.6 million active duty service members and 6.6 million non-active duty beneficiaries (<http://www.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=gao&docid=f:he98100t.txt>, 1998). Military treatment facilities (MTFs), consisting of 115 military hospitals and 471 clinics, provide most of the care and are supplemented through the contracted services of a managed care support contractor (MCSC).

Under TRICARE, eligible beneficiaries have three health care benefit alternatives. These options include: TRICARE Prime, a health maintenance organization (HMO) option; TRICARE Extra, a preferred provider organization (PPO) option; and TRICARE Standard, an indemnity or fee-for-service (FFS) option which replaced the Civilian Health and Medical Program of the Uniformed Services (CHAMPUS). TRICARE Prime is the only option that requires enrollment. TRICARE Prime enrollees are assigned to a Primary Care Manager (PCM) and must seek all non-emergent care from their PCM. Most active duty service members are automatically enrolled in TRICARE Prime, provided they reside within the catchment area, 40 miles, of a MTF. TRICARE is only available to beneficiaries less than 65 years of age. Upon reaching their 65th birthday, military retirees and their dependents become Medicare-eligible. All MHS eligible beneficiaries, including Medicare-eligibles, may obtain care at a MTF on a space available basis. TRICARE was implemented in the TRICARE Mid-Atlantic Region 2 (TMAR2) in May 1998. TMAR2 encompasses most of Virginia (excluding the Alexandria metropolitan area) and all of North Carolina and includes 11 MTFs. Anthem Alliance Health Insurance Company (AAHIC) is the MCSC for TMAR2.

NMCP's EMD has seen a dramatic increase in its daily census since the Charette Health Care Center opened. This rise may be attributed to a number of factors including:

- (a) NMCP recently closing several acute care clinics that offered extended hours,
- (b) NMCP's eligible beneficiary population increasing as a result of several aircraft squadrons and ships recently relocating to Hampton Roads, (c) seasonal factors, (d) an increase in telephone triage referrals to the EMD, and (e) a rise in the "inappropriate" use of the EMD. Inappropriate use typically refers to patients who present to the EMD with

non-urgent conditions and may stem from a lack of patient education about the proper use of emergency services or inadequate accessibility to primary care providers (Boushy & Dubinsky, 1999).

One of the biggest challenges confronting any EMD is patients who “Leave Without Being Seen” (LWBS). Several studies (Dershewitz & Paichel, 1986; Bindman, Grumbach, Keane, Rauch, & Luce, 1991; Fernandes, Daya, Barry, & Palmer, 1994) have shown waiting time is the primary reason patients LWBS. An inverse relationship usually exists between acuity level and waiting times. That is, non-urgent patients wait longer to see a physician than emergent patients. Thus, it is not surprising that most patients who LWBS were triaged with non-urgent conditions. Unfortunately, a significant number of patients with serious conditions also LWBS (McNamara, 1995). Patients who LWBS pose a significant medico-legal risk to hospitals. A hospital may be held liable if the condition of a patient who left without being seen worsens as a result of an inappropriate waiting time to see a physician (Dershewitz & Paichel, 1986).

TMAR2 falls under a form of enrollment based capitation, called revised financing. Under revised financing, each MTF assumes full financial responsibility for the care of its TRICARE Prime enrollees. Historically, if a MTF could not, or did not, provide a particular service it would refer the patient to a non-DoD provider who would be reimbursed by CHAMPUS. Since TRICARE replaces CHAMPUS, the MTF must pay for this care out of its own operating budget. Thus, each MTF now has a vested interest in capturing as much of the care for its Prime enrollees in its own facility as possible. For fiscal year 1999, NMCP incurred a revised financing bill of roughly \$24 million. It is uncertain how much of this bill could be attributed to EMD patients who left without

being seen and sought subsequent care at a civilian medical facility. Patients who LWBS may also hinder the MTF from a marketing standpoint. These patients may be very disgruntled with the care they were unable to obtain, be more apt to file complaints, view the MTF unfavorably on patient satisfaction surveys, and not hesitate in conveying this dissatisfaction to family and friends.

Statement of the problem.

Since the Charette Health Care Center opened in April 1999, NMCP has witnessed a large increase in the number of patients presenting to its EMD. In April 1999, this EMD triaged 5,139 patients, or a daily average of 171 patients. This figure soared to 6,723 patients, or 217 patients per day, in October 1999. The EMD's LWBS rate also rose from 0.25%, or 0.43 LWBS incidents per day, in April 1999 to 3.38%, or 7.32 LWBS occurrences per day, in October 1999. Like every other MTF in the MHS, NMCP operates in a managed care environment. This facility is continually trying to enroll and retain as many patients as possible in TRICARE Prime and can ill afford to assume its eligible beneficiaries must come to NMCP for their health care needs. Therefore, NMCP must strive to maintain a competitive posture and make patient satisfaction paramount.

Avedis Donabedian's criterion for health care quality assessment involves examining structure, process, and outcome measures. According to Donabedian (1988), the relationship between these categories is critical because "...good structure increases the likelihood of good process, and good process increases the likelihood of a good outcome" (p. 1745). Structures represent the stable attributes of the health care setting and includes resources (e.g. personnel, capital, equipment, and physical setting) and organizational structure. Processes are the interventions undertaken by health care personnel and how

skillfully these activities are performed. Outcome denotes the effect the health care intervention had on an individual patient or a population as a whole. Thus, NMCP's EMD should take an introspective look at its structure and processes if it wants to improve its outcome of preventing patients from leaving without being seen.

Literature review.

The poor and uninsured have long been very vulnerable to “patient dumping.” Patient dumping occurs when a private hospital transfers an emergency room patient to a public hospital merely because of the patients’ inability to pay. Dame (1998) reports that by the late 1980s, as many as 250,000 patients a year were dumped from hospital emergency departments for economic reasons. The U.S. Congress subsequently passed the Emergency Medical Treatment and Active Labor Act (EMTALA) as part of the Consolidated Omnibus Budget Reconciliation Act (COBRA) of 1985. Although this landmark piece of legislation only pertains to hospitals that participate in Medicare, it was enacted to ensure “... no one who goes to a hospital emergency room seeking emergency medical care should be turned away or sent to another medical facility in an unstable condition because he cannot pay for care, or because he is otherwise considered an ‘undesirable’ patient” (Dame, 1998, p.1). A 1993 General Accounting Office (GAO) report stated there were 99.6 million emergency department visits in 1990, a 19% increase since 1985. Williams (1996) attributes this growth to a 34% increase in visits by Medicaid patients, 29% increase by Medicare patients, and a 15% increase by uninsured patients. Emergency departments appear to have evolved into a “safety net” for providing care for the poor and uninsured and are increasingly overcrowded.

Hospital emergency departments are primarily intended to treat patients with life- or limb-threatening conditions. Unfortunately, there has been a dramatic increase in the inappropriate use of emergency departments for less serious injuries and illnesses. A 1992 National Hospital Ambulatory Medical Care Survey (NHAMCS) revealed 55% of emergency department visits are for non-urgent reasons (Gill & Riley, 1996). Providing non-urgent care in an emergency room setting is not in keeping with the “iron triangle” of health care (access, quality, and cost). Recent health care reform initiatives have typically been directed at enhancing patient access to quality health care services, while constraining costs. Non-urgent visits pose a number of problems for emergency departments and health care systems. Steinbrook (1996) states non-urgent visits contribute to rising health care costs and emergency department overcrowding, fail to provide any continuity of care, and divert attention and resources from seriously ill patients. Non-urgent care provided in the emergency department is also more costly than care rendered by other sources (Young, Wagner, Kellermann, Ellis, & Bouley, 1996). According to Baker, Stevens, and Brook (1994), individuals who do not have a regular health care provider are frequently very dependent upon emergency departments for basic medical care. Steinbrook (1996) notes individuals who seek treatment in an emergency department are able to overcome many of the obstacles ambulatory clinics present. Since physicians are available 24 hours a day in the emergency department, patients can seek treatment whenever it is convenient to them. Because of EMTALA, patients who present to an emergency department must also be evaluated regardless of their ability to pay.

Managed care organizations (MCOs) rely upon PCMs and financial disincentives (i.e. deductibles and co-payments) to dissuade enrollees from seeking unauthorized non-emergent care. Steinbrook (1996) cites a Kaiser Permanente study that found implementing a \$25 to \$35 co-payment upon its members resulted in a 15% decline in emergency department use during a one-year period. Because PCMs rely upon capitated funding, they have a vested interest in “managing” their enrollees’ health care needs. With capitation, the PCM receives a prospective payment on a per-member-per-month (PMPM) basis.

Previous studies have shown emergency departments often have LWBS rates between 1 to 2% (Fernandes, Daya, et al., 1994). However, Fernandes, Price, and Christenson (1997) revealed as many as 15% of emergency department patients LWBS. Sainsbury (1990) considers patients who LWBS to be a subset of the group of patients who leave “Against Medical Advice” (AMA). In contrast to AMA patients, who leave the hospital despite a physician’s advice to the contrary, patients who LWBS do so prior to ever being evaluated by a physician. Although most patients who LWBS were triaged as non-urgent, recent studies show a substantial number of patients who LWBS had serious medical problems (McNamara, 1995). In a study conducted at a military treatment facility, Sainsbury (1990) found 44% of the patients who left without being seen sought subsequent treatment at an emergency department or clinic within seven days of leaving that emergency department. Another study discovered over 10% of the patients who left without being seen required hospitalization within one week of visiting a public emergency department (Lombardi, Elsner, Gennis, & Gallagher, 1995). Emergency departments may have a tendency to simply ignore patients who LWBS. However,

Dershewitz and Paichel (1986) note the hospital may be held liable “...if the delay was unreasonably long, resulted in the LWOT (leave without treatment), and contributed to the continuation or exacerbation of the illness or injury that caused the patient’s visit” (p.719). Patients who LWBS can also hurt a hospital from a marketing standpoint. These patients likely leave the EMD very dissatisfied and undoubtedly share this negative experience with family and friends.

A number of factors contribute to patients electing to LWBS. McNamara (1995) found the primary reason patients LWBS is because the patient got tired of waiting, followed by the patient felt too sick to wait any longer, felt better, had work commitments, and family logistics. In a separate study, Fernandes, Daya, et al. (1994) concluded patients LWBS because they were tired of waiting, unhappy with the hospital staff, had other commitments, and thought their problem could wait. Stock, Bradley, Lewis, Baker, Sipsey, and Stevens (1994) suggest overcrowded emergency departments result from long waiting room times and reflect an inability of patients who LWBS to access emergency care.

Sainsbury (1990) concluded hospitals could not rely upon the patients’ age, sex, chief complaint, duration of illness, or vital signs to identify patients likely to LWBS. However, another study indicated patients who LWBS frequently give ample warning and that emergency department personnel must be prepared to discourage these patients from leaving (Weissberg, Heitner, Lowenstein, & Keefer, 1986). Gibson, Maiman, and Chase (1978) recommend each patient be given a brief explanation of the principles of triage and an estimated waiting time with updates occurring every 30 minutes. Patients who LWBS are often clustered during evening hours and weekends. Emergency

departments may consider adding additional staff during these periods when patients have limited or no accessibility to primary care providers. Extending primary care clinic hours would undoubtedly relieve some of the strain placed upon overcrowded emergency departments. Baker, Stevens, and Brook (1991) suggest undertaking a more dramatic approach to reduce the number of patients that LWBS. All acuity 1 (emergent) patients should be asked to remain in the emergency department for immediate medical care. Acuity 2 (urgent) patients shall be advised of their lower priority status and given an opportunity to either wait or have an appointment scheduled for them at an appropriate clinic on the following day. Acuity level 3 (semi-urgent) and 4 (non-urgent) patients should be informed that their condition does not warrant the immediate attention of a physician and be given an opportunity to have an appointment scheduled for them. Derlet and Nishio (1990) performed a study in which non-emergency patients (e.g. patients presenting with back pain, skin rash, sore throat, prescription refill request) were denied care in the emergency department and referred to an alternative source of health care. Although this study resulted in a decrease in the number of emergency department visits and patients who LWBS, Wright, Erwin, Blanton, and Covington (1992) note this practice "...has been severely criticized by some for a variety of reasons including medical, moral, legal, ethical, and financial concerns" (p. 372).

According to Meislin, Coates, Cyr, and Valenzuela (1988), emergency departments implemented "fast tracks" to regain market share that was lost to urgent care centers. These centers emerged as an alternative to emergency departments and were seen as being less costly than emergency departments and more convenient for patients with minor complaints. Fast tracks are usually staffed by physician assistants or nurse

practitioners and are geared towards seeing patients with quickly diagnosable and treatable complaints (i.e. non-urgent and semi-urgent acuity levels) in an efficient and expeditious manner. Although difficult to show a direct cause and effect relationship, researchers have found that fast tracks have had a dramatic effect on reducing the number of patients who LWBS (Wright et al., 1992). Meislin et al. (1988) also found fast tracks are associated within shorter lengths of stay (LOS) and enhanced patient satisfaction.

Another alternative for addressing overcrowded emergency departments is to examine for sources of patient flow bottleneck. Saunders (1987) states a thorough understanding of the patient flow in an emergency department can enhance the "...efficiency of care, which is important from the standpoints of cost containment, quality assurance, and patient satisfaction" (p. 1244). Undertaking an operations research approach provides insight into the consequences of restructuring the emergency department without physically altering it. Mathematical modeling of an emergency department through computer simulation would allow selected emergency department resources to be varied to examine the effect on a desired output (e.g. waiting times). Abramowitz, Joy, and Yurt (1989) report that waiting time is not the only variable that affects total visit times, but that other variables such as time waiting for consults, lab results, and disposition decisions are equally important determinants of the patients' length of stay in the emergency department.

Purpose.

The purpose of this project was to undertake an in-depth analysis to determine the characteristics of patients who left NMCP's EMD without being seen and why these patients did so. This study was accomplished by gathering a host of sociodemographic

data on patients that presented to this EMD during a two-week period and administering a telephone survey to those patients who left without being seen. Analysis entailed examining if a statistically significant difference existed between any of the data for two study groups, patients who left without being seen and patients who remained to be seen by a provider.

Chapter 2

Methods and Procedures

A qualitative, descriptive study was performed to describe patients who left Naval Medical Center Portsmouth's Emergency Medicine Department without being seen by a provider. This study was conducted over a two-week period in February 2000 and entailed examining two groups of subjects. The study group consisted of every patient who left the EMD without being seen and the comparison group was comprised of a 20% random sample of patients who waited to see a provider. Just prior to this study, NMCP's EMD was experiencing a daily census of 230 patients with roughly five LWBS incidents occurring per day. Thus, the sample sizes were anticipated to consist of 70 patients in the study group and 644 patients in the comparison group.

Although McNamara (1995) and Sainsbury (1990) conducted similar studies at military treatment facilities, neither of these individuals expounded upon the unique sociodemographic characteristics of the MTF beneficiary population. A host of categorical and numerical data was retrieved for this study from Composite Health Care System (CHCS) ad hoc reports and patient forms. CHCS ad hoc reports included the "ER JCAHO CONTROL REGISTER by Clinic" (JCAHO report) and the "TriPrime AUTOMATED VISIT LOG and PATIENT REPORT" (TRIP report). Patient forms consisted of the "Emergency Department Registration" (3rd Party) form [NMCP 6010/26 (Rev 11/98)]; the "Emergency Medicine Dept. Triage & Nursing Note" (Triage form) [NAVMEDCEN PTSVA 6400/5 (Rev 12/94)]; and the "Emergency Care & Treatment" (ETR) form (Automated Version SF558). The study variables are shown in Table 1.

Table 1

Summary of Variables for Predicting Patients who Will LWBS

Variable	Description	Data Source
Day	Day of the week patient presented to the EMD	JCAHO Report
Age	Patient's age (in years)	JCAHO Report
Gender	Patient's gender (male or female)	JCAHO Report
Group	Patient's beneficiary group (active duty, family of active duty, retiree < 65 y/o, family of retiree < 65 y/o, retiree > 65 y/o, family of retiree > 65 y/o, or other)	JCAHO Report
Branch	Sponsor's branch of service (Navy or other)	JCAHO Report
Rank	Sponsor's military rank (E1 – E3, E4 – E6, E7- E9, warrant officer, O1 –O3, O4 – O6, or not applicable)	JCAHO Report
Prime	Patient TRICARE Prime enrollee (yes or no)	TRIP Report
Complaint	Patient's chief complaint category (abdominal pain; altered mental status; chest pain; ears, nose, & throat; extremity & skin; eye; headache; male genitourinary; obstetrics & gynecology; shortness of breath; trauma; or fever)	TRIP Report

(table continues)

Variable	Description	Data source
Acuity	Patient's acuity level (emergent, urgent, semi-urgent, or non-urgent)	Triage Form
Disposition	Patient's disposition (LWBS or seen by provider)	JCAHO Report
Source	Treatment source (Main, Fast Track, or Pediatric section of the EMD)	JCAHO Report
Presented	Time frame patient presented to the EMD (12:01 a.m. – 4:00 a.m., 4:01 a.m. – 8:00 a.m., 8:01 a.m. – 12:00 p.m., 12:01 p.m. – 4:00 p.m., 4:01 p.m. – 8:00 p.m., or 8:01 p.m. – 12:00 a.m.)	3rd Party Form
T-Time	Patient's waiting time from arrival to triage	3rd Party Form & Triage Form

The Statistical Package for the Social Sciences (SPSS) for Windows (version 8.0) was used to analyze the data. Specifically, Pearson's chi-square (χ^2) test for independence of two samples was used to determine if a statistically significant difference existed between the observed and expected counts of occurrences for each of the independent categorical variables and the dependent variable, the patient's disposition. The null hypotheses were that the observed and expected counts for each of the categorical variables would be the same for patients who LWBS and patients who waited to see a provider. The possibility of committing a type I error (α), rejecting the null hypothesis when it was actually true, was minimized by selecting a relatively small and commonly used significance level of .05. Any variables with observed significance levels less than alpha would cause the

respective null hypothesis to be rejected. Variables found to be statistically significant may be useful predictors of patients who are likely to LWBS. Assumptions for the chi-square test were (a) all observations were independent; (b) the categories of variables did not overlap; and (c) at least 80% of the expected counts were greater than 5, with none less than 1 (Norusis, 1997). Some of the categories of variables were later combined because this last requirement could not be satisfied. Patient confidentiality was strictly maintained with only the observed counts for each of the categorical variables being summarized.

The two independent-samples *t* test was used to determine if the two groups, patients who LWBS and patients who waited to see a provider, had the same mean age and experienced similar waiting times to be triaged. Waiting times for patients who LWBS before being triaged was approximated by identifying the time the patient was called to be triaged. This approach provided an accurate estimate of the patient's waiting time had the patient not left the EMD without being seen. Assumptions for the *t* tests were the samples were independent and normally distributed or large enough to compensate for non-normality (Norusis, 1997). Since both of these samples were relatively large ($n > 30$), the Central Limit Theorem held that the samples came from normally distributed populations. The Levene test was also used to determine if the two samples came from populations with the same variance. The null hypotheses for the *t* tests were that the means for the numerical variables were the same for both samples. Either of the null hypotheses was rejected if the observed two-tailed significance level was less than alpha.

The chi-square test does not lead to any conclusions other than if a relationship exists between two variables (Voelker & Orton, 1993). Thus, the chi-square and *t* test results only indicated which individual variables were statistically significant predictors of patients who LWBS. A discriminant analysis was conducted to develop a multivariate mathematical model. The purpose of this model was to identify the variables that best classify patients who LWBS and patients who wait to be seen by a provider. The stepwise variable selection process was used to select the predictor variables for this model. Once a discriminant equation was found, the EMD could then predict the likely disposition of any given patient by entering the patients' pertinent information into the equation.

This study also entailed attempting to administer a telephone survey to every patient who left without being seen to determine why the patient left the EMD, if the patient sought subsequent treatment for their condition, and if the patient would likely utilize this EMD again in the future. This survey was modeled after Fernandes, Daya, et al. (1994) "Toronto Hospital Questionnaire." A copy of the NMCP telephone survey is provided in the Appendix. A telephone survey was selected in lieu of a mailed survey questionnaire in anticipation of achieving a higher response rate. Patients were intended to be contacted 48 to 72 hours after leaving the EMD and their informed consent was solicited prior to proceeding with the questionnaire. Patient confidentiality was again maintained by only summarizing the findings in a table describing the characteristics of patients who left without being seen. The survey's response rate was also reported. A copy of the Graduate Management Project Proposal (GMPP) for this Graduate Management Project (GMP)

was submitted to NMCP's Clinical Investigation and Research Department for Institutional Review Board (IRB) approval. The Chairman of the IRB subsequently granted an "exemption status" for this GMP.

The findings of this study were expected to be fairly consistent with the previously mentioned studies. Specifically, it was anticipated that most patients who left without being seen would be relatively young males who presented to the EMD with non-urgent conditions and decided to leave because they simply got tired of waiting to see a provider. It was also conceived that the typical patient who left without being seen was either a junior-enlisted Navy service member or the family member of such. None of the categories of chief complaints were predicted to be significant determinants of patients who LWBS. Most LWBS incidences would likely occur during the evening and weekend hours when the EMD experienced its heaviest volume of patients. It was also anticipated that there would be a positive correlation between EMD daily patient census and the number of patients who left without being seen.

The utility of this study was the valuable insight it provided Naval Medical Center Portsmouth's leadership by identifying which group(s) of patients left its EMD without being seen and why these patients decided to leave. LWBS rates are a valuable tool in assessing patient satisfaction. Although a low LWBS rate may not be indicative of high patient satisfaction, a high LWBS rate may be associated with patient dissatisfaction. Although this department has aggressively combated this problem through a series of initiatives (e.g. expanding the fast track and children's emergency care units), this research was intended to provide insight into the sociodemographic characteristics and

reasons why patients LWBS. A mathematical model was also to be provided to predict the likelihood of different patients deciding to LWBS. The EMD could then target these individuals to ensure they remain to be treated by a health care provider.

Chapter 3

Results

During the period of February 7 to February 20, 2000, 3,440 patients presented to NMCP's EMD. Data were collected on 813 patients, including 95 patients who left the EMD without being seen and 718 patients who waited to be seen by a provider. As shown in Table 2, the EMD's LWBS rate for this period was 2.8%.

Table 2

LWBS Rates for the Study Period

Study day	Day of the week	# of patients presenting to EMD	# of patients who	LWBS rate
			LWBS	(%)
1	Monday	287	18	6.3
2	Tuesday	243	19	7.8
3	Wednesday	234	1	0.4
4	Thursday	236	2	0.8
5	Friday	216	6	2.8
6	Saturday	268	6	2.2
7	Sunday	260	11	4.2
Week 1 total		1,744	63	3.6

(table continues)

Study day	Day of the week	# of patients presenting to EMD	# of patients who LWBS	LWBS rate (%)
		EMD	LWBS	(%)
8	Monday	276	6	2.2
9	Tuesday	213	4	1.9
10	Wednesday	249	4	1.6
11	Thursday	232	6	2.6
12	Friday	241	3	1.2
13	Saturday	228	5	2.2
14	Sunday	257	4	1.6
Week 2 total		1,696	32	1.9
Study total		3,440	95	2.8

A sociodemographic profile of the patients who left without being seen and the patients who waited to be seen by a provider is provided in Table 3. These two groups had similar distributions of the study variables. In fact, there were no statistically significant differences between any of the study variables. The average age for these groups was roughly 27 and 23 years of age, respectively. Similar studies were conducted with relatively older populations. For instance, the average for both of Bindman et al. (1991) study groups was 36 years of age.

Table 3

Sociodemographic Profile of the Study Groups^a

Variable	Patients who left without being seen (n = 95)	Patients who waited until seen (n = 718)
Age, year		
Minimum	1	1
Maximum	82	86
Mean \pm standard error of mean	26.8 \pm 1.8	23.2 \pm 0.7
Median	24	22
Gender, %		
Male	41.1	45.1
Female	58.9	54.9
Beneficiary group, %		
Active duty	23.2	23.4
Family of active duty	53.7	60.6
Retiree < 65 y/o	5.3	3.5
Family of retiree < 65 y/o	11.6	9.6
Retiree > 65 y/o	2.1	2.4
Family of retiree > 65 y/o	1.1	0.4
Other	3.2	0.1

(table continues)

Variable	Patients who left without being seen (n = 95)	Patients who waited until seen (n = 718)
Sponsor's branch of service, %		
Navy	86.3	88.3
Other	13.7	11.7
Sponsor's rank, %		
E1 – E3	11.6	14.8
E4 – E6	63.2	61.6
E7 – E9	15.8	15.6
Warrant Officer	1.1	0.7
O1 – O3	6.3	5.4
O4 – O6	1.1	1.8
Not applicable	1.1	0.1
TRICARE Prime enrollee, %		
Yes	60.0	54.9
No	40.0	45.1
Active Duty and/or TRICARE Prime, %		
Yes	83.2	78.3
No	16.8	21.7

^aPercents do not add to 100 because of rounding.

Table 4 contains a patient encounter profile depicting the nature of the EMD visits for the two study groups. The following variables were found to be statistically significant predictors of patients who LWBS: (a) came to the EMD on either a Monday or Tuesday, (b) presented during the period of 12:01 p.m. to 4:00 p.m., (c) were to be seen in the Main EMD, (d) cited abdominal pain as the chief complaint, and (e) waited at least 12 minutes to be triaged. Incidentally, the following attributes were associated with patients who were likely to wait to be seen by a provider: (a) presented to the EMD on a Wednesday, (b) arrived during the 4:01 a.m. to 8:00 a.m. time frame, (c) stated a fever was the chief complaint, (d) were triaged with an urgent acuity level, and (e) were to be seen in the Pediatric ED.

Table 4

Patient Encounter Profile of the Study Groups^a

Variable	Patients who left without being seen (n = 95)	Patients who waited until seen (n = 718)
Presenting day, %		
Monday*	25.3	16.6
Tuesday**	24.2	13.5
Wednesday*	5.3	13.8
Thursday	8.4	13.4

(table continues)

Variable	Patients who left without being seen (n = 95)	Patients who waited until seen (n = 718)
Presenting day, %		
Friday	9.5	13.8
Saturday	11.6	14.3
Sunday	15.8	14.6
Presenting time frame, %		
12:01 a.m. – 4:00 a.m.	7.4	5.4
4:01 a.m. – 8:00 a.m.*	1.1	7.7
8:01 a.m. – 12:00 p.m.	14.7	23.5
12:01 p.m. – 4:00 p.m.**	32.6	17.7
4:01 p.m. – 8:00 p.m.	25.3	25.5
8:01 p.m. – 12:00 a.m.	18.9	20.2
EMD source, %		
Main EMD***	67.4	48.2
Fast Track	13.7	19.8
Pediatric ED**	18.9	32.0
Chief complaint, %		
Abdominal pain**	29.5	18.0
Altered mental status	5.3	4.5

(table continues)

Variable	Patients who left without being seen (n = 95)	Patients who waited until seen (n = 718)
Chief complaint, %		
Chest pain	1.1	2.9
Ears, nose, & throat	11.6	11.7
Extremity & skin	24.2	18.8
Eye	3.2	3.2
Headache	3.2	3.8
Male genitourinary	1.1	1.3
Obstetrics/gynecology	6.3	4.0
Shortness of breath	5.3	6.3
Trauma	4.2	9.1
Fever**	5.3	16.6
Acuity Level ^b , %		
Emergent	0	0.1
Urgent*	6.3	15.3
Semi-urgent	41.8	37.5
Non-urgent	51.9	47.0
Average waiting time for triage ^c (minutes)**	30.1	22.3

(table continues)

^aPercents do not add to 100 because of rounding. ^bn = 79 for patients who left without being seen; n = 698 for patients who waited until seen. ^cn = 64 for patients who left without being seen; n = 679 for patients who waited until seen.

*p < .05. **p < .01. ***p < .001.

The telephone survey was administered to 71 of the 95 patients who left without being seen, a 75% response rate. Most patients were contacted 48 to 72 hours after leaving the EMD without being seen. However, some patients were reached as late as seven days after the EMD visit. Table 5 is a summary of the telephone surveys' results.

Approximately 77% of the patients indicated they were feeling better or fine at the time of the interview. Nearly 61% of the patients who left without being seen sought subsequent treatment. The most common reason for leaving without being seen was that the patient got tired of waiting to be seen, followed by the patient had other commitments or felt too sick too wait. Over 76% of the patients indicated they would likely return to NMCP's EMD in the future.

Table 5

Telephone Survey Results^a

Survey question	(n = 71)	(n = 43)	(n = 27)
How are you feeling now? (%)			
Fine	36.6		
Better	40.8		
About the same	21.1		
Worse	1.4		
Since leaving the EMD, have you sought treatment elsewhere for your condition? (%)			
Yes	60.6		
No	39.4		
If so, how long after you left this EMD did you seek treatment? (%)			
Immediately		44.2	
Within 24 hours		37.2	
More than 24 hours		18.6	
If so, where did you seek care? (%)			
Another ER		18.6	
NMCP EMD or clinic		44.2	
Other military clinic		16.3	
Other civilian clinic		20.9	

(table continues)

Survey question	(n = 71)	(n = 43)	(n = 27)
How long did you have your problem before you came to this EMD? (%)			
< 24 hours	42.3		
24 - 72 hours	18.3		
> 72 hours	39.4		
Did you attempt to schedule an appointment at one of NMCP's clinics before coming to the EMD? (%)			
Yes	38.0		
No	62.0		
If so, why was the appointment not made/kept? (%)			
Were told to come to the EMD			48.1
Problem got worse			18.5
Appointment was at an inconvenient time/date			25.9
Other			7.4
Why did you leave the EMD prior to being seen by a provider? (%)			
Got tired of waiting	33.8		
Did not want to wait	2.8		
Had other commitments	19.7		
Felt too sick to wait	19.7		

(table continues)

Survey question	(n = 71)	(n = 43)	(n = 27)
Why did you leave the EMD prior to being seen by a provider? (%)			
Felt better	9.9		
Other	14.1		
How long did you wait before you left the EMD? (minutes)	113		
Did anyone tell you how long you could expect to wait to be seen? (%)			
Yes	23.9		
No	76.1		
In the future, would you seek care at NMCP's EMD? (%)			
Yes	76.1		
No	21.1		
Not applicable	2.8		

^aPercents do not add to 100 because of rounding.

Chapter 4

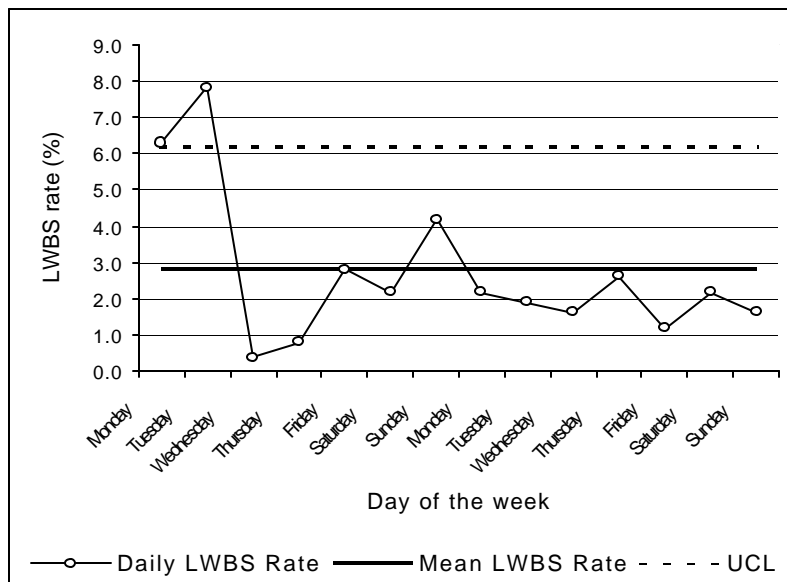
Discussion

LWBS rates.

A total of 95 of the 3,440 patients who presented to NMCP's EMD during this study period left without being seen, a LWBS rate of 2.76%. The daily number of LWBS incidents varied from 1 to 19, with daily LWBS rates ranging from 0.4% to 7.8%. Many of the patients who left without being seen did so on the first Monday and Tuesday of the study period. These two days alone accounted for 39% of the LWBS incidents. Figure 1 provides a control chart depicting the daily LWBS rates.

Figure 1

Daily LWBS Rates



The LWBS rates for the first two days of the study period exceeded the upper control limit (UCL). Although the EMD's overall LWBS rate is acceptable, the process is not in statistical control because special cause variation appears to have occurred with these two

days. Patients that presented to the EMD on the first Monday of the study period waited significantly longer to be triaged ($p < .001$) than patients who presented on the other days. The mean waiting times for triage was 45 minutes on the first Monday, compared to 21 minutes on the remaining days. Interestingly, this was not the same case for the first Tuesday. The average waiting time for triage on this Tuesday was also statistically significant ($p = .008$), but because these patients waited less time to be triaged, 17 minutes, than patients presenting on the other days, 24 minutes. There was no difference in the acuity levels of the patients who presented on the first Monday and the other days. However, patients who left without being seen on the first Tuesday were more likely to be triaged with either a semi-urgent or non-urgent acuity level ($p = .001$). In fact, only 9% of the patients who presented to the EMD on the first Tuesday were classified as having an urgent condition, compared to 15% for the other days.

This study period did not include any holidays or any other known confounding events. The daily staffing levels of the EMD was relatively constant throughout the study period. A retrospective analysis was conducted to examine the volume of patients who presented to the EMD and patients who left without being seen during the period of April 1 through October 31, 1999. Significantly more patients were found to have presented to the EMD on a Monday ($p = .008$) or Sunday ($p = .010$); while fewer patients came to the EMD on a Thursday ($p = .014$). The large number of patients who left this EMD without being seen on the first Monday of the study period can perhaps be partially attributed to the EMD having a historically larger volume of patients and LWBS incidents on Mondays. The high incidence of patients who left without being seen on the first Tuesday cannot be as easily explained. The number of patients who presented to the

EMD on this day, 243, was slightly below the mean daily average of patients for the study period, 246. Perhaps many of these patients presented during a close time interval or were of a more severe case mixture. Either one of these possibilities could have created a bottleneck in the patient flow process and resulted in longer waiting times to see a provider.

Sociodemographic profile.

There were no significant differences between any of the sociodemographic variables for patients who left without being seen and patients who waited to be seen by a provider. Sainsbury (1990) and McNamara (1995) conducted the only other known MTF LWBS studies. However, neither of these researchers presented a sociodemographic profile of the study groups. Other studies presented sociodemographic profiles, but had strikingly different findings with some of the variables.

Patients who left without being seen were typically older, an average of 27 years of age, than patients who waited to be seen, 23 years of age. Other LWBS studies were conducted on much older subjects. For instance, the average age of the subjects in Bindman et al. (1991) LWBS study was 36 years of age. NMCP's EMD appears to see a younger population than other emergency departments. This is not surprising since the MHS beneficiary population is generally considered to be younger than the general population.

Surprisingly, most of the subjects in this study were females. The majority of subjects in both of Bindman et al. (1991) study groups were males, 61% of the patients that were seen and 59% of the patients who left without being seen. Yet, other studies, such as Weissberg et al. (1986) and Baker et al. (1991), found males were more likely to LWBS

and that the majority of patients who waited to be seen were females. Roughly 54% of the patients who left without being seen and 61% of the patients who waited to be seen were family of active duty service members. Active duty service members were the next largest group, comprising approximately 23% of both groups. Although not statistically significant, active duty and retirees were predominantly males; while most of the family of active duty and retirees that presented to the EMD were females. This, as well as the fact that the majority patients for both groups were affiliated with the U.S. Navy and enlisted service members, is not surprising given NMCP's geographical location and the composition of the armed forces.

Approximately 83% of the patients who left without being seen and 78% of the patients who waited to be seen by a provider were either active duty service members or TRICARE Prime enrollees. While active duty members comprised 23% of both of the study groups, 60% of the patients who left without being seen and 55% of the patients who waited to be seen were either family of active duty members, retirees, or family of retirees and enrolled in TRICARE Prime. Most active duty service members are automatically enrolled in TRICARE Prime. According to the Defense Enrollment Eligibility Reporting System (DEERS), 48% of NMCP's eligible beneficiaries are enrolled in TRICARE Prime. Eligible beneficiaries include family of active duty service members, as well as retirees and family members of retirees less than 65 years of age. It is unclear whether TRICARE Prime patients have more acute conditions than non-TRICARE Prime patients or if non-TRICARE Prime patients simply have easier access to primary care services and are less reliant on the EMD.

Nature of the visits.

A number of variables pertaining to the nature of the EMD visit were significantly different for patients who left without being seen and patients who wait to be seen. The volume of patients who presented to EMD during this study period was fairly evenly distributed across the days of the week. However, LWBS incidents occurred disproportionately throughout the week. Over 25% of the LWBS incidents happened on a Monday ($p = .037$) and 24% were on a Tuesday ($p = .006$). Wednesdays were statistically significant ($p = .019$) because only 5% of the LWBS incidents occurred on this day of the week.

Gibson et al. (1978) found a nearly identical distribution of the days of the week in which patients present to an emergency department. However, these researchers' results differed on the days of the week in which the LWBS incidents occurred. Gibson et al. found 23% of LWBS incidents were on a Saturday, while only 12% of NMCP's LWBS incidents happened on a Saturday. Similarly, Dershewitz and Paichel (1986) reported 41% of LWBS episodes were on either a Saturday or Sunday. Only 27% of the LWBS incidents at NMCP occurred on these days. Although this study found an unusual number of patients left without being seen on the first Monday and Tuesday of this study period, the proportion of patients who left without being seen on a Saturday or Sunday was quite similar for both weeks. Approximately 27% of the LWBS incidents happened on the first Saturday and Sunday, compared to 29% on the second weekend.

The arrival time of every patient who presented to the EMD was captured in one of six time frames. Patients who left without being seen were significantly more likely to have presented during the 12:01 p.m. to 4:00 p.m. time frame ($p = .001$). In fact, nearly 33% of

the patients who left without being seen presented during this time frame, followed by 25% during the period of 4:01 p.m. to 8:00 p.m. These high occurrences may be attributed to patients being less tolerant of waiting during this time frame because of having more late afternoon and early evening commitments. This distribution of the time frames patients presented to this EMD differed from other studies. Dershewitz and Paichel (1986) found 59% of the patients who left without being seen did so during the 4:00 p.m. to midnight shift. Since it is often unclear when patients actually LWBS, this study focussed on the time frame the patient presented to the EMD and found 44% of the patients who left without being seen presented to the EMD during the 4:00 p.m. to midnight shift. Gibson et al. (1978) utilized three, eight-hour intervals (11 p.m. – 7 am, 7 am – 3 p.m., and 3 p.m. – 11 p.m.) to identify the time patients presented to the emergency department. Although this study used a slightly different scale, it found a similar volume of patients who waited to be seen presented to the EMD during the period of 8:01 a.m. and 4:00 p.m. (41%) compared to Gibson et al. study's 7:00 a.m. to 3:00 p.m. shift (40%). However, 47% of the patients who left without being seen in this study presented to the EMD during the hours of 8:01 a.m. to 4:00 p.m., compared to only 21% of the patients in the Gibson et al. study doing so. The time frame of 4:01 a.m. to 8:00 a.m. was also statistically significant ($p = .017$) because only 1% of the patients who left without being seen presented to the EMD during this period.

NMCP's EMD consists of three functionally different sections and includes the Main EMD, Fast Track, and Children's Emergency Care Unit (Pediatric ED). The Main EMD is staffed 24 hours a day; however, the other two units are only staffed during the hours of 8:00 a.m. to midnight. The Main EMD also sees the largest volume of patients.

Approximately 48% of the patients who waited to be seen were treated in the Main EMD. Not surprisingly, the Main EMD also had the highest number of patients who left without being seen. Over 67% of the patients who left without being seen were to be seen in the Main EMD. This figure is statistically significant ($p < .001$) and may be due to these patients experiencing longer waiting times because of the more complicated case mix in this section. Incidentally, patients presenting to the Pediatric ED were less likely to LWBS ($p = .009$). No other study stratified patients by different sections of the emergency department.

The chief complaint of every patient who presented to EMD was captured in one of 12 categories. These classifications were assigned by the EMD and were taken from the EMD's TRIP report. The only statistically significant chief complaints involved abdominal pain ($p = .008$) and fevers ($p = .004$). Patients who presented with abdominal pain were more likely to LWBS. However, patients who cited a fever as the chief complaint were more likely to wait to be seen. Since a number of the original 12 categories of chief complaints only had a few occurrences, the chief complaints were reclassified into four categories (abdominal pain, extremity and skin, fever, or other). This reclassification did not affect the significance of the categories and facilitated the construction of a model to classify patients who left without being seen.

Several other studies summarized the chief complaint of patients who left without being seen and patients who waited to be seen by a provider. However, none of these studies utilized the same categories of complaints as this study. Dershewitz and Paichel (1986) only captured the chief complaint of patients who left without being seen and found multiple complaints (29%) and minor trauma (22%) were the largest categories.

Fernandes, Price, et al. (1997) only classified the chief complaint of patients with urgent acuity levels and reported abdominal pain (20%), seizures (16%), and chest pain (14%) were the leading complaints of patients who left without being seen. Sainsbury (1990) classified patients who left without being seen into 14 categories of chief complaints and found the leading categories pertained to orthopedics (16.6%), infectious disease (16.0%), and gastroenterology (15.3%). Although these other researchers used different classifications of complaints, patients who LWBS often appear to have abdominal or musculoskeletal pain given as the chief complaint. Dissimilarities in the types of complaints could be attributed to these emergency departments having different physical settings, MTFs seeing a generally younger population, and seasonal factors.

The acuity level of the patients who presented to NMCP's EMD was captured on 83% of the patients who left without being seen and 97% of the patients who waited to be seen. Acuity levels for patients who left without being seen were either assigned during triage or based upon the patient's chief complaint. Approximately 93% of the patients who left without being seen and 85% of the patients who waited to be seen by a provider were classified as having semi-urgent or non-urgent conditions. Not surprisingly, patients with an urgent condition were less likely to LWBS ($p = .031$). Only one patient, who was classified as having an altered mental status condition, had an emergent acuity level.

Baker et al. (1991) presented a "triage nurse urgency assessment" with patients being categorized as having emergent, urgent, or non-urgent conditions. These researchers found 75.3% of the subjects who left without being seen had non-urgent conditions, compared to 66.8% of the patients who waited to be seen. Bindman et al. (1991) revealed 51% of the patients who left without being seen were triaged with non-urgent conditions.

This study had a nearly identical finding of 52% of the patients who left without being seen were non-urgent. Similarly, Bindman et al. found 49% of the patients who left without being seen had semi-urgent or urgent conditions, compared to 48% in this study.

In this study, 42 of the patients who left without being seen did so prior to being triaged. The time 16 of these patients were called to be triaged was documented on the patient's triage form. The average waiting time for triage was calculated using this time as well as the actual time the other 53 patients who left without being seen were triaged. The average waiting time for triage for these 69 patients who left without being seen was statistically significant when compared to the average waiting time for 679 patients who waited to be seen ($p = .006$). Patients who left without being seen either waited or would have waited an average of 30 minutes to be triaged, compared to the other patients waiting approximately 22 minutes to be triaged. A triage waiting time of 12 minutes was found to be statistically significant. No difference existed between the groups when the patients had to wait over 11 minutes for triage ($p = .087$). However, patients were more likely to LWBS when it took over 12 minutes for triage to occur ($p = .041$). Although a number of other studies examined total waiting times, no other study investigated triage waiting times. Because of the uncertainty of when most of the patients left the EMD without being seen or when a provider would have seen the patients, total waiting times were disregarded in this study.

Multivariate model.

One of the goals of this study was to produce a multivariate model to profile patients who LWBS. By having identified the characteristics of patients who left without being seen, it was hypothesized that a regression equation could be developed to permit the

EMD to determine the likelihood of any given patient leaving without being seen. The dependent variable for this model was whether the patient left without being seen or waited to be seen by a provider. The stepwise variable selection method was used to select the independent variables for this model. This technique revealed three variables to be statistically significant predictors of patients who LWBS. These variables were the patient: (a) came to the EMD on either a Monday or Tuesday, (b) presented during the 12:01 p.m. to 4:00 p.m. time frame, and (c) was to be seen in the Main EMD. Although statistically significant, this model was found to be a very weak predictor of patients who LWBS. A discriminant analysis revealed the model's canonical correlation was only .214. A canonical correlation less than .3 is indicative of a weak model (StatSoft, 1999). Although each of these variables may be characteristics of patients who LWBS, the variables appear to be of little to no use collectively.

Telephone survey.

The telephone survey was administered to 71 of the 95 patients who left without being seen. This survey's response rate, 75%, is comparable to rates found in similar studies. Bindman et al. (1991) contacted 77% of the subjects who left without being seen. Likewise, Dershewitz and Paichel (1986) successfully reached 75% of the patients who left without being seen. Baker et al. (1991) conducted a follow-up survey with 79% of the patients who left without being seen. The reasons for non-response for patients who left NMCP's EMD without being seen are provided in Table 6.

Table 6

Reasons for Telephone Survey Non-response

Reason	Number
Could not be reached	14
Wrong telephone number	4
Aboard ship	2
Hospitalized	2
Out of town	2

Patients who left without being seen were to be surveyed 48 to 72 hours after leaving the EMD. However, attempts to contact these patients were continued until one week after the LWBS incident. Two patients who left without being seen were subsequently hospitalized. One patient was hospitalized for the same condition the patient presented to the EMD with (seeking an inpatient alcohol detoxification program). The other patient was admitted to the hospital for a chronic condition unrelated to the chief complaint presented to the EMD.

Every patient was asked at least seven, or as many as nine, questions relating to the LWBS incident. Patients were first asked, “how are you feeling now?” This question was intended to serve as an outcome measure. As expected, over 77% of the patients indicated feeling “better” or “fine” since leaving the EMD. This figure is almost identical to the Dershewitz and Paichel (1986) finding that 79% of patients who left without being seen felt fine or better 48 hours after leaving the emergency department. Only one patient

indicated feeling “worse” since leaving the EMD without being seen and this was related to a chronic condition. Similarly, Dershewitz and Paichel also found only 1% of their subjects felt worse.

Almost 61% of the patients who left without being seen indicated having sought subsequent treatment since leaving the EMD. Of these individuals, 44% obtained care immediately after leaving the EMD. Another 37% sought treatment within 24 hours of leaving and nearly 19% were seen more than 24 hours after leaving. Of the patients who sought further care, 44% either returned to this EMD or one of NMCP’s clinics. One subject twice presented to this EMD and left without being seen on both occasions. Nearly 19% of the patients who left without being seen sought treatment at another emergency department. Under revised financing, NMCP would have to pay for most, if not all, of this expense for TRICARE Prime enrollees. Most of the other studies that examined if subjects sought additional care inquired if care was sought within one week of leaving. Baker et al. (1991) discovered 51% of the patients who left without being seen sought additional care within one week of leaving. Similarly, Bindman et al. (1991) had a finding of 55%. Fernandes, Daya, et al. (1994) reported 65% of the patients who left without being seen sought subsequent treatment, of which 48% did so within 24 hours of leaving the emergency department.

Subjects were asked how long the problem or condition existed prior to coming to the EMD. Approximately 42% of the patients indicated having the problem for less than 24 hours, while 39% said the complaint existed for over 72 hours. Of particular interest, patients who had an acute onset of problems, less than 24 hours, felt significantly better ($p = .001$) than patients experiencing more chronic problems, greater than 72 hours.

Fernandes, Daya, et al. (1994) discovered a higher incidence of patients presenting with an acute onset of problems (58%) and chronic conditions (23%) than this study. The Fernandes, Daya, et al. study was conducted in Toronto, amidst a universal health care system. The disparity between these two studies could be attributed to Canadians possibly having less timely access to primary care services. Young and Sklar (1995) report that Canada has an 83.5% higher per capita emergency department use than the United States.

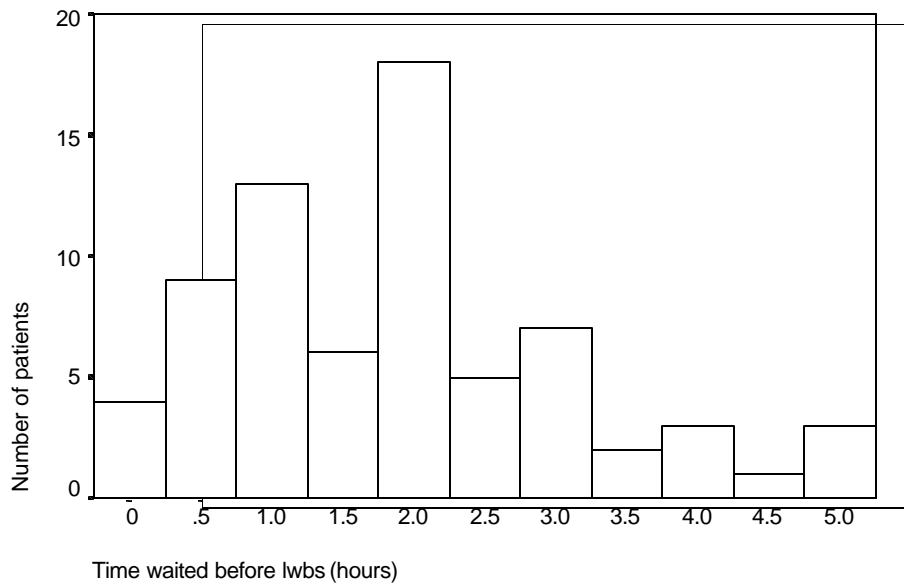
Only 38% of the patients interviewed indicated having attempted to schedule an appointment at one of NMCP's clinics prior to presenting to the EMD. When asked why an appointment was not made or kept, 48% of these patients reportedly were told to come to the EMD. Nearly 26% of the patients said the appointment was not soon enough. Another 19% of the patients said that the problem had worsened and felt they could wait until their appointment to be seen.

The leading reason these patients left without being seen was because of being tired of waiting to be seen by a provider (34%). Other reasons for leaving included 20% of the patients having other commitments (e.g. childcare concerns or having to go to work). While 10% of the patients left because of feeling better, 20% felt too sick to wait. This particular question was rather limited because patients were asked to provide only one reason for leaving. Like every other study that examined why patients LWBS, the principal reason these patients left without being seen is because of the waiting time. Some of the other responses provided appear to be reasons why the patient felt they could not wait to be seen.

Patients were also asked how long they waited prior to leaving the EMD without being seen, since it was unknown how long most of these patients actually waited. The histogram in Figure 2 depicts how long these patients reported waiting before leaving.

Figure 2

Amount of Time Patients Waited Before LWBS



The amount of time patients indicated having waited prior to leaving ranged from not at all to 5 hours. The mean waiting time was 1 hour and 53 minutes and the median time was 2 hours. In fact, 18 patients, or 25% of the patients who were interviewed, indicated having waited two hours prior to leaving. These findings are similar to the discovery of Fernandes, Daya, et al. (1994) that 75% of their subjects left within two hours of presenting to the emergency department, compared to 70% in this study. Yet, Dershewitz and Paichel (1986) revealed only 46% of their patients left within two hours of presenting to the emergency department. This lower rate could be because the Dershewitz and

Paichel study was conducted with data from the 1982 to 1983 time frame. More and more families now rely upon dual incomes or are headed by a single parent. People today may be less tolerant of waiting than they were 18 years ago.

Patients were also asked if anyone in the EMD provided them with an estimated waiting time. Approximately 24% of the patients indicated receiving a time estimate. It was hypothesized that patients who were given an estimated waiting time would be more tolerant of waiting and less likely to LWBS. According to the disconfirmation paradigm, patients are usually content when their expectations are met and are either pleased or dissatisfied if these expectations are not met, depending upon the circumstances (Fernandes, Price, et al., 1997). Thus, if a patient is given an estimated waiting time, the patient will probably be pleased if the actual waiting time is less than expected. However, the patient will likely be upset if the actual time exceeds the anticipated time. Providing patients with estimated waiting times could be a double-edged sword.

Surprisingly, this study revealed patients who were given an estimated waiting time waited for a shorter period of time before leaving the EMD than patients who also left without being seen but were not given an estimation ($p = .013$). The average waiting time prior to leaving for those patients who were given an estimated waiting time was 74 minutes, compared to 125 minutes for patients who were not provided a time estimate. Incidentally, several of the patients who were given time estimates left the EMD immediately upon being provided the information

The patients were also asked if they would likely return to this EMD again in the future. Over 76% of the patients indicated they would return. This figure may be somewhat misleading. A number of the patients, particularly the younger subjects,

indicated that they had no other option for seeking emergency care unless they wanted to pay for this care themselves. It must be noted however, that a number of patients also remarked they were very pleased with the care they had previously received at this facility and appeared to be quite empathetic about the strain the high volume of patients has placed upon the EMD. Furthermore, several patients also commented on how much they appreciated the telephone call and said they “felt better” as a result of the call. Only a few patients appeared to be upset about not having received care at the EMD.

Chapter 5

Conclusions and Recommendation

Conclusions

Patients who leave an emergency department without being seen by a provider pose a serious concern not only to themselves, but hospitals as well. These patients may risk further injury or illness by not obtaining prompt medical care. Hospitals are also exposed to medico-legal risks as well. The purpose of this study was to compare and contrast the characteristics of the patients who left Naval Medical Center Portsmouth's EMD without being seen with a random sample of the patients who remained in the EMD to be seen by a provider. A telephone survey was also administered to determine why these patients decided to LWBS and to obtain an outcome measure of the general health status of the patients as a result of having left the EMD without being seen.

Over a two-week period in February 2000, data was collected on 813 patients who presented to NMCP's EMD, including 95 patients who left without being seen and 718 patients who waited to be seen. No significant differences were found in the sociodemographic profiles of these two groups. However, a number of variables pertaining to the nature of the EMD visits were statistically significant. Patients who left without being seen were more likely to have: (a) presented to the EMD on either a Monday or Tuesday, (b) arrived during the hours of 12:01 p.m. to 4:00 p.m., (c) had a chief complaint of abdominal pain, (d) waited longer than 12 minutes to be triaged, or (e) been expected to be seen in the Main EMD. Conversely, patients who were most likely to wait to be seen by a provider either: (a) came to the EMD on a Wednesday, (b) presented during the 4:01 a.m. to 8:00 a.m. time frame, (c) cited a fever as the chief

complaint, (d) were triaged as having an urgent condition, or (e) were to be seen in the Pediatric ED. Although the aforementioned traits may characterize these groups, a meaningful predictive model could not be constructed to profile these groups.

This study also entailed attempting to administer a telephone survey to all of the patients who left without being seen. A 75% response rate was achieved with this survey. The majority of the patients interviewed indicated having felt better since leaving the EMD. Patients who experienced an acute onset of symptoms, less than 24 hours, were more likely to be feeling better than patients with more chronic conditions, lasting more than 72 hours. Approximately one-third of the patients interviewed either had, or attempted to, schedule an appointment at one of NMCP's clinics prior to coming to the EMD. Nearly half of these patients came to the EMD because they were told to do so. The leading reason the patients left without being seen was because they were tired of waiting to be seen. However, because the patients were limited to only one reason for leaving, the other responses obtained during the survey appear to be specific reasons why the patient could not wait to be seen. These patients reported waiting an average of two hours prior to leaving without being seen. Interestingly, patients who were given an estimated waiting time waited less time before leaving, an average of 74 minutes, than patients who were not provided a waiting time estimate, an average of 125 minutes. Three-quarters of the patients indicated they would probably return to NMCP's EMD. However, many of these individuals said it would be more as a matter of necessity than choice.

Limitations

This study contained a number of limitations. First, this study was conducted for only a two-week period of time in February 2000. Because it only provides a snapshot of NMCP's EMD during this time frame, data collected over a longer or different period of time may result in different findings. The results could also differ as a result of seasonal factors. Although this EMD has seen a dramatic increase in its daily census since opening a new facility in April 1999, a serious outbreak of the influenza virus is reported to have occurred this winter. It is unknown how many of the patients in this study presented with flu-like symptoms. The study was also conducted at a large, military teaching hospital located in a moderately sized metropolitan area. Thus, its findings may not hold true at other types of medical facilities.

Managerial Implications

According to Fernandes, Daya, et al. (1994), no emergency department has been able to achieve a LWBS rate less than 1%. NMCP's EMD LWBS rate for this study period was a modest 2.76%. This figure would have been considerably lower, 1.99%, if it had not been for two study days, the first Monday and Tuesday, having a substantially higher number of patients LWBS. Patients were subsequently found more likely to LWBS on either a Monday or Tuesday. Other studies have shown a higher incidence of LWBS occurrences on weekends. This EMD's daily LWBS rates should continue to be monitored. This tracking would provide a more accurate LWBS rate, reveal if the high volume of LWBS incidents on the first two days of this study was an anomaly, and also serve as an important quality assurance measurement.

Recommendations

This study was descriptive in nature and was intended to present a profile of patients who LWBS and patients who wait to be seen, as well as determine why patients LWBS. The underlying reason patients LWBS is because of waiting times. The vast majority of patients who presented to this EMD did so with relatively minor complaints, semi-urgent and non-urgent acuity levels. Many families rely upon dual incomes or have a single head of the household. Thus, the EMD's high volume of patients could be a reflection of the inability of its beneficiaries to obtain prompt access to primary care services. Expansion of the Fast Track and Pediatric ED areas of the EMD has relieved some of the strain placed upon the Main EMD. However, if the primary care services are not going to be offered during the evening and weekend hours, then perhaps more resources should be devoted to the EMD to relieve this strain. NMCP has access to a given number of military health care providers. Thus, additional providers would most likely need to be contracted. The EMD also has only a finite amount of treatment spaces. An alternative would be to position the Fast Track or Pediatric ED in one of the primary care clinics during the evening and weekend hours.

As previously noted, this study was only descriptive in nature. It is recommended that the EMD consider conducting a time-and-motion study to construct a computer simulated model of the patient flow process. This model could identify potential bottlenecks in the patient flow process. The EMD could examine the anticipated affect various changes (e.g. modifying staffing levels or the number of treatment spaces) would have on patient flow and waiting times in a controlled environment. Development of such a model would be a significant undertaking, however the results would be well worth the effort.

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Appendix

Telephone Survey

1. How are you feeling now?
 - a. Fine b. Better c. About the same d. Worse
 2. Have you sought treatment elsewhere for your condition?
 - a. Yes b. No
 3. If so, how long after you left this EMD did you seek treatment?
 - a. Immediately b. Within 24 hours c. More than 24 hours
 4. If so, where did you seek care?
 - a. Another ER b. Clinic at NMCP c. Other Military Clinic
 - d. Other Civilian Clinic
 5. When did you begin to experience symptoms for the condition you sought treatment for?
 - a. < 24 hours b. 24 – 72 hours c. > 72 hours
 6. Why did you leave the EMD prior to being seen by a provider?
 - a. Tired of waiting b. Did not want to wait c. Had other commitments
 - d. Felt too sick to wait e. Felt better f. Other _____
 7. How long did you wait before you left the EMD? _____ (in minutes)
 8. Did anyone tell you how long you could expect to wait to be seen?
 - a. Yes b. No
 9. In the future, would you seek emergency care at NMCP?
 - a. Yes b. No
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